IN THE CLAIMS:

Please amend the claims as follows:

1-4. (Canceled)

5. (Currently Amended) A method of providing automated assistance in configuring customer premises equipment for communication with service provider network element, comprising:

automatically identifying a first valid protocol, a first valid channel, ~~and~~ a second valid protocol, and a second valid protocol for configuration with the customer premises equipment without a user intervention; and

assisting the user in configuring the customer premises equipment for use with the identified valid protocols;

wherein automatically identifying the valid protocols for configuration with the customer premises equipment comprises:

communicating toward a first service provider network element a first probing configuration signal;

receiving a response to the first signal;

identifying the first valid protocol and first valid channel via the response from the first signal;

communicating toward a second service provider network element a second probing configuration signal;

receiving a response to the second signal;

identifying the second valid protocol and second valid channel via the response from the second signal,

wherein the first and second valid protocols are different protocols, and

wherein the CPE is configured with the first valid protocol, the first valid channel, the~~and~~ second ~~protocols~~valid protocol, and the second valid channel.

6. (Previously Presented) The method of Claim 5, wherein one of the probing configuration signals comprises an F5 Operations, Administration, and Maintenance loopback signal.

7. (Previously Presented) The method of Claim 5, wherein one of the probing configuration signals comprises a signal having a self configuring protocol.

8. (Previously Presented) The method of Claim 7, wherein one of the probing configuration signals comprises a Dynamic Host Configuration Protocol request, a Link Control Protocol Configuration Packet, or a Point-to-Point Over Ethernet (PPOE) PADI packet.

9. (Previously Presented) The method of Claim 8, wherein one of the valid protocols comprises an Internet over ATM protocol.

10. (Previously Presented) The method of Claim 8, wherein one of the valid protocols comprises a Point-to-Point over Asynchronous Transfer Mode protocol or a Point-to-Point over Ethernet protocol.

11. (Previously Presented) The method of Claim 5, wherein communicating the probing configuration signal comprises communicating the probing configuration signal over a plurality of virtual channels, each virtual channel being a logical signal connection.

12-15. (Canceled)

16. (Original) The method of Claim 5, wherein communicating the probing configuration signal comprises communicating a plurality of probing configuration signals approximately simultaneously.

17. (Previously Presented) The method of Claim 16, wherein communicating a plurality of probing configuration signals approximately simultaneously comprises:

spawning a plurality of threads, each thread operable to process signals associated with a virtual channel;

communicating a probing configuration signal over a plurality of virtual channels; and

monitoring the probing configuration signal associated with each virtual channel using a separate thread.

18. (Previously Presented) The method of Claim 16, wherein communicating a plurality of probing configuration signals approximately simultaneously comprises communicating a plurality of probing signals approximately back-to-back over the virtual channel.

19-20. (Canceled)

21. (Previously Presented) A method of providing automated assistance in configuring customer premises equipment for communication with another network element, comprising:

automatically identifying a valid virtual channel and a valid protocol for configuration with the customer premises equipment by communicating a first diagnostic signal associated with a first of a plurality of valid virtual channels and the valid protocols toward a destination network element, the valid virtual channel being a logical signal connection; and

determining connectivity of a network layer based on whether a response to the diagnostic signal is received; and

when a response is not received, communicating a second diagnostic signal associated with a second of the plurality of virtual channels and protocols, the virtual channel being a logical signal connection,

wherein the identifying and configuration of the valid virtual channel and valid protocol are provided without a user intervention.

22. (Original) The method of Claim 21, wherein the diagnostic signal comprises a Protocol Internet Groper ("PING") signal operable to test an Internet Protocol layer of the network.

23. (Previously Presented) The method of Claim 21, wherein the diagnostic signal comprises a domain name server resolution request signal operable to test a Transmission Protocol layer of the network, the Transmission Protocol layer is a Transmission Control Protocol.

24. (Original) The method of Claim 21, wherein the diagnostic signal comprises a Hypertext Transmission Protocol request signal operable to test an Application layer of the network.

25. (Original) The method of Claim 21, further comprising reporting on the connectivity of a network layer based on whether a response to the diagnostic signal is received.

26. (Previously Presented) The method of Claim 21, wherein the customer premises equipment comprises a modem.

27-30. (Canceled)

31. (Currently Amended) A computer readable medium operable to execute the following steps on a processor of a computer:

automatically identifying a plurality of valid virtual ~~channel~~ channels and a valid protocol for configuration with the customer premises equipment by

communicating over a plurality of virtual channels and toward a service provider network element a probing configuration signal, each of the plurality of virtual channels being a logical signal connection;

receiving over the valid virtual channel a response to the configuration signal, the valid virtual channel being a logical signal connection;

identifying a protocol via the response of the valid virtual channel;

configuring the customer premises equipment with the valid virtual ~~channel~~ channels and the valid protocol.

32. (Original) The computer readable medium of Claim 31, wherein the probing configuration signal comprises an F5 Operations, Administration, and Maintenance loopback signal.

33. (Original) The computer readable medium of Claim 31, wherein the probing configuration signal comprises a signal having a self configuring protocol.

34. (Canceled)

35. (Original) The computer readable medium of Claim 31, wherein communicating the probing configuration signal over a plurality of virtual channels comprises communicating the signal over plurality of virtual channels likely to return a response.

36. (Original) The computer readable medium of Claim 31, wherein communicating the probing configuration signal comprises:

communicating the signal over a first virtual channel; and

communicating the signal over a second virtual channel before a time out value associated with the signal communicated over the first virtual channels expires.

37. (Original) The computer readable medium of Claim 31, wherein communicating the probing configuration signal comprises:

communicating a first probing communication signal over a virtual channel; and

communicating a second probing configuration signal over the same virtual channel before a time out value associated with the first probing configuration signal expires.

38. (Original) The computer readable medium of Claim 31, wherein communicating the probing configuration signal comprises communicating over a virtual channel a plurality of probing configuration signals, each signal associated with a different protocol.

39. (Original) The computer readable medium of Claim 31, wherein communicating the probing configuration signal comprises communicating a plurality of probing configuration signals approximately simultaneously.

40. (Original) The computer readable medium of Claim 39, wherein communicating a plurality of probing configuration signals approximately simultaneously comprises:

spawning a plurality of threads, each thread operable to process signals associated with at least one virtual channel;

communicating a probing configuration signal over a plurality of virtual channels; and

monitoring the probing configuration signal associated with each virtual channel using a separate thread.

41. (Original) The computer readable medium of Claim 39, wherein communicating a plurality of probing configuration signals approximately simultaneously comprises communicating a plurality of probing signals approximately back-to-back over at least one virtual channel.

42.-60. (Canceled)

61. (Previously Presented) An apparatus operable to provide automated assistance in configuring customer premises equipment, the apparatus comprising:

a configuration manager operable to automatically identify a valid virtual channel and a valid protocol for configuration with the customer premises equipment without a user intervention, the valid virtual channel being a logical signal connection; and

a memory accessible to the configuration manager and operable to store an identifier of the valid virtual channel and the valid protocol based on a response to a probing configuration signal; and

wherein the configuration manager comprises a configurator operable to initiate communication of the probing configuration signal over a virtual channel and toward a service

provider element, to receive a response to the configuration signal, and to identify as valid for configuration the valid virtual channel and the valid protocol associated with the response, the virtual channel being a logical signal connection; and

wherein the configurator is operable to communicate over a virtual channel a packet comprising a plurality of probing configuration signals, each signal associated with a different protocol.

62.-67. (Canceled)

68. (Currently Amended) A method of providing automated assistance in configuring customer premises equipment, comprising:

communicating over a plurality of virtual ~~channel~~ channels and toward a destination network element a probing configuration signal, ~~the~~ each virtual channel being a logical signal connection, the probing signal operable to identify a valid virtual channel and a valid protocol without retrieving an identification of the valid virtual channel and the valid protocol from a predefined look-up table, the valid virtual channel being a logical signal connection;

receiving over the virtual channel a response to the configuration signal, whereby the virtual channel having received the response is the valid virtual channel; and

identifying a protocol of the response, whereby the protocol of the response is the valid protocol,

configuring the customer premises equipment with the plurality of valid virtual ~~channel~~ channels and the valid protocol,

wherein communicating the probing configuration signal comprises communicating the

probing configuration signal over a plurality of virtual channels approximately simultaneously.

69. (Original) The method of Claim 68, wherein the probing configuration signal comprises a signal selected from the group consisting of an F5 Operations, Administration, and Maintenance loopback signal, a Dynamic Host Configuration Protocol request, a Link Control Protocol Configuration Packet, or a Point-to-Point Over Ethernet (PPOE) PADI packet.

70. (Canceled)

71. (Previously Presented) The method of Claim 68, wherein communicating a plurality of probing configuration signals approximately simultaneously comprises:

spawning a plurality of threads, each thread:

operable to process signals associated with a virtual channel;

communicating a probing configuration signal over the virtual channel; and

monitoring the probing configuration signal associated with the virtual channel.

72. (Previously Presented) The method of Claim 68, wherein communicating a plurality of probing configuration signals approximately simultaneously comprises communicating a plurality of probing signals approximately back-to-back over at least one virtual channel.

73. (Original) The method of Claim 68, wherein communicating the probing configuration signal comprises:

communicating the signal over a first virtual channel; and

communicating the signal over a second virtual channel before a time out value associated with the signal communicated over the first virtual channels expires.

74. (Original) The method of Claim 68, wherein communicating the probing configuration signal comprises:

communicating a first probing communication signal over a virtual channel; and

communicating a second probing configuration signal over the same virtual channel before a time out value associated with the first probing configuration signal expires.

75. (Previously Presented) The method of Claim 68, further comprising:

displaying the at least one of the valid virtual channel and the valid protocol to a user;

receiving the user's selection of the at least one of the valid virtual channel and the valid protocol; and

configuring the customer premises equipment for operation using the selected at least one of the valid virtual channel and the valid protocol.

76. (Previously Presented) The method of Claim 68, further comprising automatically configuring the customer premises equipment for operation using the at least one of the valid virtual channel and the valid protocol.

77. (Original) The method of Claim 68, further comprising:

communicating a diagnostic signal toward a destination network element; and

determining connectivity of a network layer based on whether a response to the diagnostic signal is received.

78. (Original) The method of Claim 77, wherein the diagnostic signal comprises a signal selected from the group consisting of a Protocol Internet Groper ("PING") signal, a domain name server resolution request signal, and a Hypertext Transmission Protocol request signal.

79. (Original) The method of Claim 77, further comprising reporting on the connectivity of a network layer based on whether a response to the diagnostic signal is received.

80.-82. (Canceled)

83. (Previously Presented) The method of Claim 5, wherein a predefined look-up table is not read order to identify the first and second valid protocols.

84. (Previously Presented) The method of Claim 31, wherein a predefined look-up table is not read in order to order identify the valid protocol.

85. (Currently Amended) The method of Claim 31, wherein the plurality of valid virtual ~~channel~~ channels and valid protocol ~~is~~ are identified and configured without a user intervention.

86. (previously presented) The method of Claim 85, wherein user intervention is a responding to a prompt of a Graphical User Interface.

87. (previously presented) The method of Claim 5, wherein user intervention is a responding to a prompt of a Graphical User Interface.

88. (previously presented) The method of Claim 21, wherein user intervention is a responding to a prompt of a Graphical User Interface.

89. (previously presented) The method of Claim 61, wherein user intervention is a responding to a prompt of a Graphical User Interface.